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## SANITARY CONDITIONS IN ALASKA.

By EML KRULISH, Passed Assistant Surgeon, United States Public Health Service.

During the period from April to November, 1912, I had the opportunity to visit the towns and native villages on the southern coast of Alaska, in Cook Inlet, on the Yukon River, and on the coast of Bering Sea. The area of the Territory of Alaska is approximately one-fifth that of the United States. Transportation facilities are inadequate, uncertain, and at times difficult. On my tour of investigation I traveled on the regular passenger steamers, in private launches, by teams, on railroad trains, and on revenue cutters. The distance covered was approximately 7,000 miles.

Throughout my itinerary study was made of the sanitary conditions in the settlements and native villages and of the prevailing diseases in each section. Physicians and other persons who possessed knowledge of the conditions in which I was interested were interviewed. As many natives as possible were examined, and in these examinations special effort was made to determine the number suffering with tuberculosis, trachoma, or venereal disease.

### POPULATION.

The population of Alaska, according to the census of 1910, was 64,356; 36,347 were whites and 28,009 were natives and others; 25,331 were natives. The native population had decreased 14.5 per cent between 1900 and 1910.

The towns and native villages are located either on the coast or on the bank of a river. These settlements range from 40 to 3,500 people. Fifteen of the towns are incorporated and have a combined population of about 18,000. These towns have a mayor, council, and other municipal officers provided for by the Alaska code.

The native population is distributed over Alaska as follows: The Indians are located in southeastern Alaska and on the upper Yukon River and the Aleuts in the vicinity of Cook Inlet and the Aleutian Islands, while the Eskimos live on the lower Yukon River, the Kuskokwim River, and along the coast of Bering Sea north to Point Barrow.

With the exception of the incorporated villages, the enforcement of the registration of births and deaths in a country like Alaska, in which the population is scattered over a large territory in isolated districts, is rather difficult and unsatisfactory. Although the councils of two towns have adopted ordinances providing for such registration, the records are not kept accurately and therefore are valueless. The registration of births and deaths is important, and should be under the supervision of the Federal Government. An excellent bill providing for this work in Alaska is now pending before Congress.

The teachers in the Alaska school service have been reporting monthly the births and deaths among the natives in the vicinity of the schools. During the school year of 1912 the birth rate varied in different sections from 26 to 43 per thousand inhabitants, while the death rate was 19 to 36 per thousand. The birth rate exceeded the death rate in all districts with the exception of the southeastern, where the death rate exceeded the birth rate by 6 per thousand. These figures are compiled from data from 52 schools, and are based on an approximate population of 7,118 natives.

Circular letters have recently been sent to all teachers in the school service calling their attention to the importance of these reports, and directing them to collect and report these data with care and accuracy.

#### CLIMATE.

The climate varies in different sections of Alaska from the temperate to the extremely frigid, as it does in the United States. The Japan current has a great influence on the climate of the southern coast. There the winters are mild while the summers are quite warm; the rainfall in the southeastern section is heavy throughout the year; about 100 inches. Farther west, in the vicinity of Cook Inlet, the precipitation is much less; the climate is drier, but the winters are colder. On Bering Sea it is comparatively dry, the summers are short and quite warm, but the winters are cold. The climate of the interior, on the Yukon River, is the driest in Alaska, and the range of temperature is the greatest. The winters are extremely cold, 70° below zero F., while the summers are hot but short. The summers are very short on the Arctic coast and the winters long and very cold, but the temperature does not drop as low as it does in the interior and it is comparatively dry. The region north of the coast and beyond the influence of the warm current is frozen during seven or eight months of the year.

#### HABITATIONS.

The style of homes in Alaska varies according to the climate and the material available for building purposes. There are practically no brick or stone buildings in the country. On the southern coast the houses are built of lumber or logs; even the natives in southeastern Alaska live in large frame houses. On the Yukon, where timber is plentiful and freight rates are prohibitive the prevailing type of dwelling is the log house, which is well adapted to the climate of that section. The natives of Bristol Bay and the Kuskokwim live in sod houses, while along the lower Yukon, and on Bering Sea, and the Arctic coast, where no natural timber is available, and driftwood supplies both fuel and building material, the homes are small and constructed of pieces of board, store boxes, tin, tar paper, and sod. As fuel is scarce these homes are small, usually having but one room.

The whites live in frame or log houses, and as a general rule have better homes than the natives. The houses of the half breeds are also usually an improvement over those occupied by the full bloods.

#### WATER SUPPLY.

The towns along the southern coast are usually supplied with excellent spring water which is piped into the houses, while rain and seepage water is used by natives in the villages. In Cook Inlet a number of the settlements have shallow wells which are fairly well protected. On the Yukon the river water is used for domestic purposes; in winter this is obtained through a hole in the ice. On the Bering Sea both St. Michael and Nome are supplied with spring water which is piped into the town during four months of the year, while the remainder of the year it has to be hauled from these springs and distributed to the dwellings in buckets. Along the Arctic coast either rain or river water is used in the summer and melted snow and ice in winter.

In spite of the favorable conditions present for contamination of the water supply, there are no water-borne diseases in Alaska. The few cases of typhoid that have been reported in the Territory have been imported into the country from the outside.

#### DISPOSAL OF SEWAGE AND GARBAGE.

As the settlements in Alaska are usually located on some body of water, the problem of drainage is a simple one. The larger towns on the southern coast are supplied with sewers which carry off excreta and other waste matter into the sea. Garbage and refuse are disposed of by burning or dumping into the sea and are then carried off by the tide. On the Yukon, in summer, garbage is usually dumped into the river at some distance below the town and in winter it is deposited on the ice where it remains until the break up in the summer, when it is carried to the sea. In communities not supplied with sewers, ordinary house drainage is disposed of by emptying on the ground or into pits, while human excreta is disposed of in privies, the pail system being in use in towns on the Bering Sea.

The methods of disposal of refuse in the native villages vary in different sections. On the sea coast, garbage and rubbish are thrown into the sea, while in settlements located on rivers they are thrown into the river. During the winter months the refuse is allowed to accumulate in the villages and is usually cleaned up in the spring and disposed of. This clean-up is generally forced upon the natives by the teacher of the school in the village. In a few communities the natives have privies, which are not, however, constructed on sanitary principles, but the majority of the settlements have no such provi-

sion but deposit the excreta promiscuously. The Public Health Service bulletin, "The sanitary privy," has recently been distributed to the superintendents and physicians in the Alaska school service.

#### DISPOSAL OF DEAD BODIES.

The bodies of the dead are usually buried under ground both by whites and natives, but there are still a few communities in Alaska where they are deposited on the ground and covered with stones or logs, or placed on a litter above ground.

#### MORBIDITY.

As a general rule there is little sickness in Alaska, for the climate is conducive to healthfulness, and, with the exception of diseases like pneumonia, rheumatism, and tonsilitis, the white population is unusually healthy. The natives, however, are afflicted with many ailments, which are chiefly the result of their unhygienic living and the lack of facilities for treatment and isolation of the infected. Tuberculosis, eye affections, and venereal diseases are the most important.

Other conditions and diseases which I found among the natives were heart disease, stomach troubles, adenoids, hysteria, locomotor ataxia, pleurisy, scabies, impetigo, scrofula, rachitis, epilepsy, one case of feeble-minded, and two deaf-mutes.

Erysipelas, smallpox, measles, infantile paralysis, chicken pox, and influenza have occurred in epidemics. The case mortality among the natives in these epidemics has been exceedingly high.

It is interesting to note that the natives living in villages which are adjacent to white settlements are more diseased than those living in isolated districts.

#### *Eye diseases.*

Diseases of the eye are most prevalent in southeastern Alaska; about 23 per cent of the natives in this section show evidence of having had eye trouble at some time, while the Eskimos are the least affected—only 6 per cent—although snow blindness is common in the spring. Trachoma, keratitis, cataracts, blepharitis, and conjunctivitis are the common eye diseases, and are the causes of blindness and corneal opacities. A large part of the blindness and partial loss of vision among the natives of Alaska might have been prevented by treatment of these cases in the early stages of the disease.

#### *Trachoma.*

Trachoma is most prevalent among the natives of southwestern Alaska—13 per cent—but comparatively absent in the Eskimos. No cases of the disease have been observed among them by me

although several have been reported by other physicians. It is my opinion that trachoma was introduced into Alaska by the Russians in the early days, for it is common in the regions formerly settled by them and absent in others. Trachoma is the common cause of blindness among the natives.

I have repeatedly selected entire families out of a group of natives by examination of their eyelids. In these instances, usually, the mother was partially blind, the older children exhibited the disease in the advanced stage, while the youngest children showed signs of but recent infection.

#### *Tuberculosis.*

Tuberculosis is comparatively rare among the whites but in the natives it is present in all its forms and stages. The percentage of tuberculosis and the type of the disease vary in different parts of the Territory; the pulmonary form is most common among the Eskimos, while tuberculosis of the bones is most prevalent among the natives along the southern coast. I have seen several cases of Potts disease of the spine followed by paralysis of the lower limbs from pressure on the cord.

The climate, type of dwelling, and mode of living are directly responsible for the difference in various sections. In southern Alaska the Indians live out of doors, in camps, for a greater number of months in the year than the Eskimos of the north, who for eight months are confined in small, crowded, unventilated one-room homes, in which all crevices are sealed to keep out the cold.

The benefit of ventilation and fresh air is clearly demonstrated by the improvement observed in tuberculous natives on their return to the villages from the summer camps. This annual outing prolongs the lives of many of those affected.

Of the natives examined about 15 per cent had tuberculosis, including all forms and both the active and latent types. In 7 per cent the disease was present in the active stage. Considering the unhygienic conditions in the average native home and that the opportunity for the spread of the infection is ever present, this is a remarkably low percentage.

#### *Syphilis.*

It is rather difficult to determine accurately the number of natives who are infected with syphilis, for this disease is not always manifested externally. Some of the blindness and a large percentage of the corneal opacities appear to be due to keratitis, the result of inherited syphilis.

Syphilis in the Alaskan natives usually has ulcerative manifestations, and some of these cases have been erroneously diagnosed as leprosy.

*Smallpox.*

Occasional epidemics of smallpox have occurred in different localities in Alaska, and last year it was present in Dawson, Yukon Territory, and among the natives on the boundary line. This is essentially an imported disease; it is carried into the Territory from the States. Hundreds of people enter Alaska each spring from all parts of the United States to work in the mines and canneries during the summer season, and the danger of bringing smallpox or other contagious diseases into the country is always present. It is therefore important to take precautions and carefully examine and vaccinate at the port of embarkation all persons coming to Alaska. Many of the localities to which these laborers go are isolated and out of reach of any medical supervision, and in the event of the appearance of an epidemic the situation would be difficult to control and expensive to manage.

*Infantile paralysis.*

The history of infantile paralysis and deformities resulting therefrom has come to my notice among the natives at Seldovia, Klukwan, Sitka, Unalakleet, and St. Michael.

## FOOD POISONING.

Ptomaine poisoning has been reported to be not uncommon among the natives, and occasionally a case is reported to occur among the whites. The condition is alleged to be especially common in the isolated districts in which large quantities of canned foods are consumed.

In some parts of the Territory the natives eat fish heads which have been previously buried in the ground until they have undergone putrefaction; this dish they consider quite a delicacy. I have treated seven cases of poisoning due to the eating of putrid moose meat.

## CARE OF PREMISES.

The danger of spreading disease in Alaska by contaminated water, food, and insanitary premises is apparently present, but water-borne diseases as previously stated are unknown in the Territory.

Although the premises in the native villages appear in disorder and unclean with cans, rags, animal matter, and other refuse scattered promiscuously, infection is not acquired through this medium. It is in the crowded, unventilated homes, where all eat out of the same dish, drink from the same teapot spout, use the same towel, and expectorate on the floor, that the principal danger of contagion exists and that tuberculosis and trachoma are most frequently contracted.

The sanitary conditions in the white settlements and homes are usually better than those of the natives but I have seen some that were equally bad.

#### CONDITIONS IN THE VOLCANIC DISTRICT.

Directly after the eruption of Mount Katmai I proceeded to Kodiak and Afognak to render assistance to the refugees in the volcanic district and to supervise any sanitary measures that might be necessary. At Kodiak I found Dr. Silverman, the local physician, attending to the sick and directing the sanitary work, while Asst. Surg. Brecht, attached to the revenue cutter *Manning*, supervised the work at Afognak. There was no loss of life due directly to the eruption, but many persons suffered with inflammation of the throat and eyelids, caused by irritation from the floating dust.

#### HEALTH LAWS IN ALASKA.

The health laws applicable to the Territory of Alaska are the national quarantine act and the Alaska Code. In the latter, Chapter X deals with "offenses against the public health," and provides against selling unwholesome provisions; adulterating provisions, drugs or medicines; polluting water used for domestic purposes; spreading dangerous diseases; and selling poisons without label. In addition, the councils of incorporated towns have the power "to take such action by ordinance, resolution, or otherwise as may be necessary to protect and preserve the lives, the health, the safety, and the well-being of the people in the town, and to publish such ordinances."

In order to obtain reliable information of the activities of the principal municipalities in Alaska in safeguarding the public health, the mayors of all incorporated towns were requested to furnish copies of all ordinances and regulations on matters pertaining to public health adopted by the council under the above authority. The subjects upon which information was especially desired were indicated to be: Vaccination; the report of births, deaths, and infectious diseases; disposal of sewage and garbage; interment and disinterment of bodies; and the destruction, and prevention of propagation, of flies.

All the towns from which these ordinances were received made provisions for the appointment of a health officer, the disposal of garbage and sewage, the abatement of nuisances, and the isolation of cases of contagious diseases. No community in Alaska has an ordinance relating to the disposal of bodies; the destruction, and prevention of propagation, of flies; or for compulsory vaccination, except that the council of one town has the authority to direct the health officer to vaccinate persons in case of an actual epidemic of



smallpox. The health officer of a certain town in Alaska drafted an ordinance directed against flies and the spread of disease by insect life, but the council would not pass it because its drastic requirements would entail great expense.

There is no reason, therefore, why any incorporated community in Alaska should be without adequate health protection, the extent of this legislation depending entirely upon the desires of the people in each community. The majority of the towns are fairly well protected in this respect, although the laws are not well enforced. This neglect is doubtless due to the prevailing idea of and faith in the superlative healthfulness of the climate. This may be partially true in reference to the white settlements, but in native villages the enforcement of sanitary laws is of the utmost importance. These villages are located in isolated districts and with a few exceptions are beyond the jurisdiction of any incorporated town.

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## PLAGUE.

### A NOTE ON THE HISTORY OF THE DISEASE IN HONGKONG.

By B. W. BROWN, Surgeon, United States Public Health Service.

The importance of Hongkong as a shipping port, and the fact that vessels from all parts of the world call at this port, not only for cargo, but for repairs, thus affording special opportunities for rat infestation, makes the history of plague in the colony of Hongkong of interest and importance to health officers at every seaport. There is little doubt that certain of the plague epidemics of recent years in various ports of the world could be traced to rat infestation at Hongkong.

The first mention of plague in China, as far as I can ascertain, was in 1844, just after the Egyptian epidemic. The *Overland Friend of China*, of May 23, 1850, contains the following:

The city of Canton and the neighboring towns and villages are afflicted by a malignant fever. The disease is said to be fatal invariably; its victims linger 3 or 4 days though in some instances they have died in 12 hours.

This was in all probability plague. Mr. A. P. Harper, jr., in the Imperial Maritime Customs Annual Report for 1889 states that Yunnan, which is a Province about 900 miles from Hongkong, had suffered annually from plague, and Drs. Lowry and Harder record that plague has been practically endemic in Pakhoi, about 400 miles south of Hongkong, since 1874; but Mr. J. Dyer Ball, a very distinguished Chinese scholar, after a most careful and painstaking research through Chinese history states that he could find no reference to any severe epidemics.

The first and most severe epidemic of plague in Hongkong began in May, 1894, just after a large Chinese procession had taken place in